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ABSTRACT

This project examines the technological resources and their organization in the Education Resource Centre of the Faculty of Education at York University (Ontario). Research was conducted at four education resources centers in other Faculties of Education and in six resource and computer centers of various types in schools. Analysis of the data resulted in a set of concepts to be considered in organizing and using technology relative to resource centers and a snapshot of material currently in use. The first section of the report covers student resource needs, provision of education resource material, resource center organization, recommendations, and a list of centers visited. The second section explores current technological resources in education resource centers including hardware and other equipment, software (tool software, CD Roms, and other formats), remote resources available through telecommunications, and selection resources and reviews. (Contains 22 references.) (ND)

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ED 401 243

INTEGRATING NEW TECHNOLOGIES

INTO THE FACULTY OF EDUCATION

RESOURCE CENTRE

**(Written for the Faculty of Education
at York University, Ontario, Canada)**

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JULY 1994

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INTEGRATING NEW TECHNOLOGIES INTO THE FACULTY OF EDUCATION RESOURCE CENTRE

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INTEGRATING NEW TECHNOLOGIES INTO THE FACULTY OF EDUCATION RESOURCE CENTRE

INTRODUCTION

This project originated out of my involvement with the Education Resource Centre of the Faculty of Education at York University during my assignment as Education Bibliographer in 1991-2. The primary concern of the Dean of the Faculty of Education was to use new technologies to provide services in the Resource Centre. In working on the project I found it necessary however to put the technological resources in the context of the whole service provision of the Education Resource Centre, and to look at their relationship to the Faculty of Education in general.

Most of my research was conducted within the framework of the Ontario educational system, as that is where the graduates of the Faculty of Education at York University primarily find jobs. In researching this report I examined related literature, visited 4 Education Resource Centres in other Faculties of Education and visited 6 resource centres and computer centres of various types in schools. Most of these schools were in North York, the school district where York University is located, mainly for ease of access but also because I considered them to be likely to be representative of the target level of expertise that would be required of York graduating students. A list of the institutions visited is attached to this report. I also sent out a survey to other Faculty of Education resource centres in Canada, and their responses were taken into consideration in compiling this report.

It is obvious than this report touches only the tip of the iceberg in investigating technological resources and their organization in Education Resource Centres. The constant rapid changes in this field make any report outdated before it is set on paper, and the exponential proliferation of materials and methods of access and use make any attempt to capture them in a project as small as this an impossible task. What I have hoped to convey is a set of concepts that could be considered in organizing and using technology relative to Resource Centres, and a snapshot at this point in time of some of the materials currently being used

Throughout this report the term "resource centre" refers to education resource centres as found in Faculties of Education, which have as one of their functions responsibility for curriculum materials. "Resource Centre" refers to a specific centre, usually the Education Resource Centre at York.

PART 1. GENERAL CONSIDERATIONS

STUDENT RESOURCE NEEDS

The resources available to students in Faculties of Education should be based primarily on what they need to prepare themselves for their courses in the Faculty and for their future entering the classroom. Using resource materials today is a complex task. Non-print format materials need machines, all different and often constantly changing. In addition the new formats need a new mindset that will enable them to be used creatively, and this will only come once the constraints of becoming familiar with the mechanics have been overcome. It does not mean however that the old machine-less format of print is outmoded. It is still the cheapest, most accessible and most-used medium in the classroom, and any consideration of resource materials should ensure that access to print materials is not neglected. It should constantly be kept in mind that selection policy in the choice of format should be based on instructional goals, and that one type of format should not consume all available resources to the detriment of others equally, if not more, valuable.

> "As you begin to integrate computers into your teaching and planning, ask yourself the fundamental question "What can I do with computers better than without them".(1)

Resources needed by York Faculty of Education students include the following:

- academic materials in all formats (print, AV, microform, computer, including CD ROM and offsite databases)
- lesson planning materials and guides
- Ontario Ministry of Education Guidelines
- Ontario Circular 14 (list of approved materials) textbooks
- children's literature
- curriculum materials in all formats (as above for academic materials plus pictures, games, puzzles, models and other realia)
- access to equipment with which to use these materials
- opportunity to become familiar and knowledgeable in using all these media and equipment so that they can integrate them into their teaching when they graduate

Integral to the choice of what materials should be chosen or what skills supported should be consideration of the competencies that are required of teachers. In relation to computer use, the Ontario Ministry of Education 1993 document *Computers across the Curriculum* states:

> In order to help students to acquire the knowledge, skills and attitudes they will need for lifelong learning, educators need to make use of a number of different tools, of which the computer is one. In general, the integration of the use of computers into all areas of the curriculum is designed to help educators and learners become more comfortable, competent and critical users of this technology.
>
> To achieve this outcome, those involved in the planning and implementation process shall provide ways to:
>
> - make the use of computers in the educational setting as inviting as possible
> - incorporate the use of computers into all areas of the curriculum from the early years to the specialization years
> - involve learners on an equitable basis in computer activities
> - encourage learners to regard the use of computers as they do the use of other educational tools - that is, as an "everyday" part of the learning process and the learning environment
> - enable learners to use computers for a variety of learning purposes (e.g. experimentation, inquiry learning, problem solving, interactive learning, drawing, composing, role playing)
> - help learners to become aware of ethical issues relating to the use of computers and to help them develop ethically appropriate attitudes and behaviour with regard to the use of computers
> - help learners to think critically about the computer in order to use it as appropriately and effectively as possible (2)

What does this translate into in practical requirements schools desire in the teachers they hire? In many schools the teacher may have little or no support in using new technologies. Even in large boards with assistance provided centrally, this is limited, and with the current financial constraints in education, it is unlikely it will be greatly expanded, at least in the near future. In documents on student-related computer outcomes from school boards, in journal articles and in conversations with the teachers I visited, the following were identified as competencies related to computer technology that educators would currently like to see in new teachers:

- have an understanding of computers and their impact on the educational and social framework of our society

- know the basics of computer operations; be able to install hardware and software and do basic maintenance

- be familiar with databases and know basic searching skills such as using integrated library systems, Boolean logic etc

- use tool software such as word processing, graphics, DBMS, spreadsheets, desktop publishing, presentation software, communications

- be able to incorporate the above skills into their own and student activities as an integral part of their teaching

- keep abreast of new developments and be able to evaluate and assist with recommendations for new hardware and software acquisitions

To this should be added a basis of knowledge of audiovisual technology that would enable them not only to use sound and video materials alone, but also to be able to incorporate them into the multimedia applications that are the next technological wave to roll into classroom computing.

Most of the literature relating to preparing preservice education students to use computer technology deals with overall concerns such as defining outcomes, course requirements and the importance of faculty involvement. It emphasizes that the use of computers in teaching should not just be an "add-on" or a replacement of a print-based resource or procedure by an automated one, but must involve a fundamental shift of vision in the way teaching is conducted, and it should be integrated into all pre-service teaching, not just be confined to certain courses. That however is not going to take place unless the student feels comfortable enough with the mechanics of computers to be able to advance to the point of creative use of the technology.

PROVISION OF EDUCATION RESOURCE MATERIAL

The function of the resource centre is to support the total Faculty program. The technology and resources it contains, and the budget and support needed must be integrated into the total Faculty plan, whether for computers or for non-automated but still useful materials.
For the Faculty of Education to prepare its students with their needed skills and knowledge, it will need to make available to them instruction, facilities, materials and support in all formats. Ideally students should have access to resources in materials and equipment with instruction and support available as needed as a "seamless web" without jurisdictional barriers. How and where resources are available is of less importance than that they **are** available.

Sources for resource provision

In the resource-rich urban area of Toronto, education resources are available from a variety of sources. At York, the university libraries can provide academic material and much government-produced information. School boards have resources available to practice teachers. The Ontario Institute for Studies in Education is a transit ride away with a wealth of curriculum resources.

The rapid growth of the resources on the Internet has extended also the range of material available. Most university libraries are accessible through communication links, as are ERIC and other databases, bibliographies, test descriptions, software and other materials. There is also a variety of local and international networks dealing with K - 12 education, ranging from interactive projects to lesson ideas and bulletin board conferences.

It is not only the existence of resources that is important however, it is also their accessibility. The student needs to know where they are and how to access relevant information quickly. Even though education resources are among the best-organized on the Internet, accessing them and keeping up with new developments is a complex and time-consuming task. Many students do not have the skills or the time to use them effectively. Faculty tend to overestimate the skills of their students in using computers (3)

Studies have shown that the use of materials is in direct correlation to the time it takes to reach them (4). The education resource centres I visited based their collections and services on the need to have resources located where the students could get them and use them. If resources are not easily accessible, and the use of them is not demanded in course work assignments,

many students just will not use them, or even know about them (5). They will graduate from the faculty with gaps in the knowledge they should have to be successful in their teaching careers. Accessibility will not come about by itself. It will need the organization and maintenance of many links and procedures, the provision of staffing expertise and knowledge, and sufficient budget to maintain an adequate level of the educational resources that are needed close at hand. It is the institution's role to work out the best structure for ensuring that students have adequate access to the various resources required, and each institution will have a unique organizational design for their provision.

RESOURCE CENTRE ORGANIZATION

Generally speaking, resource centres in Faculties of Education fall into 2 main categories. Under one model, the resource centre provides materials for both academic and curriculum support. In the other, the main university library provides the academic support and the Faculty of Education provides the curriculum support. This is the model chosen by York. The choice is usually related to historical factors and the university library organization. In a university such as the University of British Columbia, where there are many departmental libraries, the education library acts as a departmental library with both types of materials. At Queen's University the Faculty of Education is physically separated from the rest of the campus, and the resource centre supplies both academic and curriculum support. This combined role model is the most usual. Other institutions besides York however,such as Brock University, have chosen the second model, which separates the 2 functions. Advantages of the combined model are "one stop shopping" for the users, better integration of the academic and curriculum components and greater staffing resources, with resource centre staff being able to keep up with the developments in all areas of education more easily. Advantages of the separated model are that a much more in-depth and far-reaching collection of academic resources, not only in education but also in related subject areas, are available to education students; also education materials can be made available to students in other disciplines without the expense of duplicating costly materials.

Measures can be taken to mitigate the disadvantages of the separated model. There needs to be close cooperation between the academic library and the curriculum library and constant efforts to maintain awareness by Faculty of Education users, both faculty and students, of the resources available in the university libraries. York education faculty, for example, need to be made

aware that education policy materials and reports are available in the Government Documents library. Faculty also need to design assignments for their students that will necessitate using the university library resources. Teachers in the schools complain that not all York Faculty of Education students know how to use an automated library system, which implies they have not had to use the York University libraries.

It is also necessary to ensure that the non-academic curriculum resource centre has an adequate level of staffing, both in quantity and professional expertise, to maintain a quality service. To run an effective resource centre, whether integrated or curriculum-based, requires a person in charge who is able to perform high-level functions. These include the formulation of goals and objectives, operating policies and procedures and collection development policies; responsibility for budget and selection decisions; ability to select, supervise and train staff; liaison with faculty and administration to position the resource centre's services to respond to current needs; representing the resource centre in discussion and decisions within the Faculty of Education and to outside groups such as other Faculty of Education education resource centres.

In my survey of resource centres in Faculties of Education all centres responding (80% of those surveyed) indicate that they have at least 1 professional librarian on their staff.
In addition, sufficient staff, whether student or non-student, are needed to enable the resource centre to operate adequately during the hours the centre is needed. To achieve the critical mass needed to justify such a staffing level, resource centres have often been combined in organizational groupings which take advantage of the supervised space, organizational techniques, security and long opening hours of the resource centre to provide services other than strictly curriculum materials. Examples of such services are : maintenance of limited-access collections such as tests; A-V materials and equipment; maintenance of theses collections or class sets; lesson materials preparation workrooms.

Resource Centre survey summary

11 of the 14 resource centres I contacted either responded to my survey or were visited by me. 2 of those not responding were in the process of changing their organizational structure.

9 of the centres provided both academic and curriculum resources.

The number of faculty served ranged from 30 to 165

The number of students (excluding single course upgrade courses for practising teachers) ranged from 375 to 4524

The number of staff ranged from 4 to 12 FTEs excluding student assistants

The number of professional librarians ranged from 1 to 6.5

The budget for curriculum materials ranged from $20,000 to $70,000

The % of the acquisition budget that was allotted to computer materials ranged from 5% to 35%

Hours of opening were most commonly 8 - 9 or 10 on weekdays, closing at 5 on Friday; Saturday and Sunday afternoons.

Advent of computer technology

With the increasing role of computers in education, faculties of education have developed computing centres with faculty, staff, machines, materials, space and budget separate from their library/curriculum resource centres. Staff in computing centres are selected for their computer expertise. Proximity of the resource centre is not initially considered in the location of the computing centre.

As computers move more and more into storage and access to resource materials however, links between the 2 types of centre become more and more necessary. Curriculum materials are being produced first on floppy disks, then CD ROMs, now increasingly in multi-media format or downloaded from distant sites through communications technology. Library catalogues are now virtually all online, many accessible from remote sites. Periodical indexes are distributed on CD ROMs.

At the same time, the use of the computer for course work means that accessibility to workstations and tool software is needed by students at hours longer than the computer centres can afford to staff. The resource centre can provide these hours, supervision, and a basic level of support if the supervising staff is adequately trained.

These factors support the eventual combination in some form of the 2 sorts of centre.

Some models are:

- a computer lab is set up as part of the resource centre or immediately adjacent to it. Access to the lab is available whenever the resource centre is open. Computer materials available are basic tool software and curriculum resource materials. Some communications access to outside sites is available

- the computer centre is separate, but the resource centre contains machines and software copies that allow students to work at the programs pertaining to their courses when the computer centre is shut. Tool software, curriculum materials and the equipment needed to run them, including A-V, multimedia and communications are available in the resource centre.

- the computer centre staff maintain the resource centre equipment and train the resource centre staff in its use

- responsibilities, policies and procedures are coordinated and clearly established for the acquisition of both hardware and software for the resource centre.

In any model it is important that there be close cooperation and provision for input into decision-making from both the computer and resource centre people. In my survey, 5 of the centres had (or were about to have) formal links with computing in the Faculty and 3 had informal links. To facilitate this, the tendency is for the two centres to be combined at some administrative level. At Queen's, for instance, there is close contact between the librarian and the teacher and technician who work with the computer skills course and in the computer lab. The librarian sits on the computer committee. At Brock, plans are for the resource centre to take over administrative responsibility for the computer lab. Each Faculty of Education will need to examine its own set of circumstances for the best way to provide this kind of administrative linkage.

CONCLUSION

There is no one way to design an education resource centre and no one format of materials that should be kept there. The design, function, budget and staffing resources should grow out of an examination of the needs of the student body and the overall coordination of resources to meet that need, so that the needs can be met as efficiently and cost-effectively as possible. In providing resource access through technology, the Centre would benefit by close cooperation with the Computer Centre. However computer-based resources are not the only ones needed by the students. Materials in print and other formats still form a large part of students' resource needs. To maintain optimum selection and efficient service for all resource formats requires careful overall planning and an adequate commitment of staffing and financial resources.

RECOMMENDATIONS

1. Examine the resources required to meet the students' needs as described above, and identify where gaps occur.

2. Investigate what resources can be provided outside the Education Resource Centre, e.g., the resources available through the main university libraries, those available through host schools, local Boards of Education and other accessible educational institutions. Ensure that both students and faculty are aware of these resources and their availability and that students are given assignments to familiarize them with necessary skills.

3. Identify how the shortfall in resources can best be covered - print, computer, AV ? purchase or access? cooperative arrangements? Should materials purchased be housed in the Resource Centre or elsewhere? Allocate budget in line with priorities established.

4. Draw up and prioritize a list of equipment needs for these resources and where this equipment should most advantageously be placed to provide a) access and security b) instruction and support. This may be in the computer lab, an A-V lab or the Resource Centre.

5. Organize the administration of the resources and equipment components so that there is maximum availability, cooperation and communication, and an avoidance of duplication.

6. Provide an adequate level of staffing and expertise so that the Resource Centre can take a proactive role in determining its functions and resources

7. Involve faculty in the selection, use and evaluation of the resources.

6. Consider the best structure to administer the Resource Centre in view of its increasingly related role to the computer centre.

NOTES

(1) Karin M. Wilburg, "Teaching Teachers about Technology", *Computers in the Schools"*, 8 (1/2/3 1991): 121

(2) Ontario Ministry of Education, *Computers across the Curriculum;* Toronto;Queen's Printer, 1993:p 4

(3) Kathleen Fulton, Technology Training for Teachers; a Federal Perspective", *Educational Technology* 29(3)(March 1989): 13

(4) See for example the studies on cost-benefit analysis done by the King Research Institute of Rockville, Maryland

(5) Letter from the Metro Toronto Elementary Teacher-librarians' Association to the York Faculty of Education (March 30th 1994) noting that students are not aware of or using the resources in school libraries and media centres.

LIST OF CENTRES VISITED

Brock University Faculty of Education Instructional Resource Centre, St. Catherine's, Ont.

Queen's University Faculty of Education Library, Kingston, Ont.

University of British Columbia Education Library, Vancouver, BC.

University of Toronto Faculty of Education Library, Toronto, Ont.

Scarborough Board of Education Computers in Education Department, Scarborough, Ont.

Bayview Elementary & Middle School, North York, Ont.

C.W. Jeffreys Collegiate Institute, North York, Ont.

Don Mills Collegiate Institute and Middle School, North York, Ont.

Owen Public School North York, Ont.

George Vanier Secondary School, North York, Ont.

PART 2. CURRENT TECHNOLOGICAL RESOURCES IN EDUCATION RESOURCE CENTRES AND SCHOOLS

HARDWARE AND OTHER EQUIPMENT

My observations of hardware in the schools was from the point of view of the library/resource centre, as in the schools I visited, this was the area where electronic resource materials were kept, and also where students could go to work on their projects, including those that were computer-related. In the secondary schools particularly there would be another computer lab used for computer classes, but this would not be generally available to students working on their own time. In the elementary/junior schools I visited, the computer labs were integrated with or adjacent to the resource centre.

Typical configurations would be several Macs networked to a printer on which would be loaded tool and curriculum software. In addition there would be CD ROMs loaded on standalone machines or occasionally networked. Usually these were IBM machines, but sometimes Macs. The reason seemed to be that whereas the Macs were the machine of choice for classroom applications, the resource centre was responsible for buying and maintaining the CD ROMs, which are more generally available for IBMs. There would also be machines (again usually IBMs) for staff and for accessing the centre's OPAC.

Some centres had Apple IIs but these were being gradually phased out in favour of more up to date and powerful machines. Owen P.S., a new school, had purchased machines with hard drives and internal CD ROM drives for all its Macs.

The better-equipped schools also had hardware for multimedia, sound and videodiscs. Most schools had a scanner. Laser printers were almost always mounted as part of a network.

Communications capability was not much in evidence. In most cases it was limited to one machine, and used to access the local public library or one of the school networks, such as Nynet. This is changing. Two of the schools were planning to network all the school computers, and this would make outside access more generally available.

It was evident that the resource centre teachers were more or less on their own when it came to dealing with this equipment. Technical help is available in North York from one central technician for all schools. Some help can be expected from computing teachers on staff, but it is the onsite teachers who

select, set up, maintain and create applications for their hardware.

The resource centres in the Faculties of Education were generally less well equipped, even in those centres which provide both academic and curriculum resources. Typically they had a number of terminals to access their university library's OPAC. They had in addition a small number of computers with CD ROM drives, and PCs for staff use. More IBMs were reported than Macs, and there were a few Apple IIs. The ones I visited relied on computing labs in the Faculty to provide much of the hardware for student practice. Only one reported multimedia capability using laserdiscs. The advent of the PowerPC was commented on by one.

Almost all centres reported using computer communications to access resources in their own institution, in other institutions and on listservs.

Most centres have an extensive collection of AV materials and the AV equipment to use them.

SOFTWARE

The lists following represent responses given to me from visits and surveys of the software used in resource centres in Faculties of Education and in schools. They are grouped in descending frequency of times mentioned. The first group represents titles mentioned by all or most of the centres; the second group titles mentioned several times; the third those mentioned only once or twice. This is a very rough frequency list, as the notes I made undoubtedly missed some titles in some centres. The asterisk denotes those mentioned only in the Faculty resource centres.

Tool software

ClarisWorks
Hypercard
Microsoft Works
WordPerfect

CorelDRAW*
Filemaker Pro
Kid Pix
MacDraw
MacPaint
MacWrite
Pagemaker
Print Shop
Ready Set Go
Writing Centre

Addmotion
AppleII Pascal*
AppleWorks*
AutoCAD*
Cricket Graph
DbaseIV*
Draw Perfect
Excel
Fast Pitch
FirstClass
Harvard Graphics*
Hyperkit
Library Master*
Logo Writer
Lotus 123
MacTuring 3.1
Mosaic*
Move II
Photo Essay
Plan Perfect*

PowerPoint
Quattro Pro*
SuperPaint
Toolbook*
WetPaint

Curriculum Discs

This list represents only the small selection of titles specifically mentioned. Most sites have a much greater selection, but consider that many of these programs are becoming outmoded. Some of the more enduring and popular titles (such as Carmen San Diego) are being issued in a "deluxe" or enhanced version on CD ROM.

Where in the World is Carmen San Diego?

Canadian Geography
Mavis Beacon Teaches Typing
Number Munchers
Storybook Weaver
Writing Centre

Autodisk Multimedia Explorer
Bedford Accounting
Castle of Dr. Brain
Crosscountry Canada
Incredible Reward
Lemmings
Logo programs
Mac Globe
Math Blasters
Math Rabbit
Oregon Trails
PC Globe
Playroom
Reader Rabbit
Simply Accounting
Simulators (eg Sim Earth, Sim City)
Typing Tutor
Typing Time
Word Munchers

CD ROMs

Some of these titles are available in multimedia versions. Not included are titles already listed under Curriculum Discs which are also available as CD ROMs.

Academic (Faculty Centres only)

AV Online
Current Contents
Education Index
ERIC
International ERIC
Mental Measurements Yearbook
OAIP
Onteris
PsycLit
Sociofile

K - 12 Resources

Compton's Encyclopedia
DisCis Library (10 books)
Grolier's Encyclopedia
National Geographic Mammals
World Book Information Finder

Canadian Encyclopedia
Canadisk
Ebsco Magazine Article Summaries (3 different levels)
Encarta Multimedia Encyclopedia
Shakespeare
SIRS Researcher (full text and index)
World Atlas

Aesop's Fables
Anatomist
Battle Chess
Canadian Newsdisc
Children's Reference Plus
Dictionary of 20th Century History
Great Cities of the World
Guinness Disc of Records
Journeys series
Just Grandma and Me
Macleans
Nautilus
Oceans Below
Readers' Guide

Sitting on the Farm
Time Table of History
Time Almanac
Toronto Star
Toronto Board of Education Primary/Junior Activities for the Mac
Webster's Dictionary and Webster's Thesaurus

Other formats

Other non-print formats from which materials may be selected are laserdiscs, videodiscs, videos and audiotapes. Increasingly the trend is to provide multimedia software as the appropriate hardware becomes more readily available

REMOTE RESOURCES AVAILABLE THROUGH TELECOMMUNICATIONS

The resources available now through telecommunications for education are among the most highly organized of the subject domains. Knowledge of these off-site resources is a requirement for the resource centre manager, as not only can it provide a far wider range of resources than any one centre can afford to stock, but by being aware of strategic databases and services from educational sources on the Internet, for example, a considerable virtual collection can be made accessible at little cost to resource centre users.

Resources range from ERIC, with its databases and services such as the ERIC index to journals and reports, ETS tests database and the AskERIC service, to resources such as BigSky Freenet and SchoolNet with lesson plans, shareware software, computer conferences and bulletin boards for exchange of information, to student networks for exchanging messages such as KidLink and Kids from Kanata. Well organized lists like those from the University of Michigan Clearinghouse are available to assist users to find the best resources. With the rapid expansion of the Internet, it is likely that network information will assume an ever-increasing importance for the resource centre and it is vital that staff keep abreast of developments and are able to guide students in their access and use.

(Note: no list of Internet resources is included becuse the rapidity of changes has made the listing originally compiled no longer valid)

SELECTION RESOURCES AND REVIEWS

Reviews of computer curriculum resources for schools can be found in most major journals dealing with K - 12 education as well as in journals for school libraries.Computing Teacher, Computers in Education and Educational Technology were mentioned in particular by people interviewed. Library and teaching related organizations often supply sample lists, such as the one from the ALA Curriculum Materials Center Collection Development Policy included here.

Educational software is now a big market item for the general public who want to see their children get ahead, and who are now buying CD ROM drives as well as computers. General computing periodicals also review not only tool software but also educational materials. Sources of reviews that were specifically mentioned included *PC Magazine* and *MacUser*. Whie researching this survey, I found, for example, comprehensive reviews of educational software in *CD-ROM Professional, Home Computing and Entertainment*, and *Quill and Quire*.

There are a rapidly proliferating number of sources available through communications networks of selection information and in some cases shareware that can be downloaded. Most major schoolboards have computer conferences on which teachers trade information on the programs that they have used. There are Internet accessible sites such as NyserNet and SchoolNet from which this information can be obtained. Computer bulletin boards and listservs are also sources. The OTELA-L listserv run by Jo Smith at the Brock Faculty of Education Instructional Resource Centre is one specifically targeted to Ontario education resource centres which frequently includes information on computer curriculum materials.

Products licensed by the Ontario Ministry of Education are the most likely to be found in schools because of the cost factor, and the Education Resource Centre should be sure to obtain a copy of their list. Other lists of selected software are obtainable from Boards of Education and other governmental agencies.

Distributors often distribute "Top Ten" lists and product reviews (if they are favourable to the product they are selling).

The review articles and distributors' catalogues can be used to identify major software producers such as Broderbund and Learning Company Software from which catalogues can be obtained.

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